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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,248	07/01/2003	Donald J. Curry	D/A3009Q1	3357

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EXAMINER	
LAROSE, COLIN M	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/612,248	CURRY ET AL.	
	Examiner	Art Unit	
	Colin M. LaRose	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Arguments and Amendments

1. Applicant's arguments and/or amendments dated 17 May 2007, have been entered and made of record.

Response to Amendments and Arguments

2. Applicant's currently amended independent claims 1, 4, 7, and 10 and corresponding remarks have been considered but do not overcome the previous rejections.

First, claims 1, 4, 7, and 10 have been amended to denote that the type of selector signal produced is a "threshold" selector signal. As indicated in the previous Office action, Barthel produces a signal that indicates which image regions are selected for subsequent edge processing—in figure 3, all the connected regions in the image are determined (1st block) and then size filtration is performed (2nd block) in order to identify those regions lying within a certain size range. Therefore, the results of the size filtration step produce a signal indicative of the "selected" regions. Such a signal can also be considered a "threshold" selector signal since it represents the selection of certain image regions lying within a certain size range defined by upper and lower thresholds, *i.e.* a minimum size and a maximum size (see column 6/43-50).

Second, claims 1, 4, 7, and 10 have been amended to denote that the signal is produced "based on the control signal." As previously indicated, the output of the "quantizing/binarizing" block in figure 1 corresponds to a control signal. Such a control signal is input to the "text detection (segmenting)" block and is used in order to produce the selector signal (see e.g. figure 3, where the connected regions are identified in the quantized image). Accordingly, the threshold

selector signal is produced on the basis of the control signal, which is represented by the binarized/quantized signal.

For these reasons, the previous rejections have been maintained.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-3 and 10-12 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 and 5-7 of U.S. Patent No. 6,987,882 by Curry et al. ("Curry '882") in view of U.S. Patent 6,301,386 by Zhu et al. ("Zhu") and U.S. Patent 6,731,800 by Barthel et al. ("Barthel").

Claim 1 of Curry '882 recites all of the limitations as that of claim 1 of the present application, except claim 1 of the present application recites the additional limitation of "(a) sub-sampling the image signal by a programmable amount" and then receiving the sub-sampled image for outputting a foreground and a background signal.

Zhu discloses a method (figure 1) for identifying text apart from background in an image in order to process the text for recognition purposes and the like. In particular, Zhu teaches that, prior to segmenting the foreground text from the background (108), it is advantageous to sub-sample the image (103). The sub-sampling step is preferred because, according to Zhu, the reduction in resolution has the effect of reducing processing demands. However, the sub-sampled image will still exhibit sufficient detail to permit effective text/background segmentation. See column 3/3-8. In view of this teaching that an input image to be subjected to foreground/background separation can be sub-sampled in order to reduce the computational intensiveness, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify claim 1 of Curry '882 by Zhu to achieve claim 1 of the present invention by sub-sampling the inputted document image.

In addition, present claim 1 also recites that the selector signal is a "threshold" selector signal and is produced based on the control signal. Such limitations, however, are considered obvious variants of claim 1 of Curry '882 in view of Barthel. As explained above in paragraph 2, Barthel teaches that selector signals produced in an MRC environment can be conventionally characterized as "threshold" selector signals and based on a control signal.

Dependent claims 2 and 3 of the present invention recite the same additional features as dependent claims 2 and 3, respectively, of Curry '882, and therefore, they are also obvious variants of the corresponding claims of Curry '882.

Claim 5 of Curry '882 recites all of the limitations as that of claim 10 of the present application, except claim 10 of the present application recites the additional limitation of "(a) sub-sampling the image signal by a programmable amount" and then receiving the sub-sampled image for outputting a foreground and a background signal, and is written in means-plus-function language.

Zhu discloses a method (figure 1) for identifying text apart from background in an image in order to process the text for recognition purposes and the like. In particular, Zhu teaches that, prior to segmenting the foreground text from the background (108), it is advantageous to sub-sample the image (103). The sub-sampling step is preferred because, according to Zhu, the reduction in resolution has the effect of reducing processing demands. However, the sub-sampled image will still exhibit sufficient detail to permit effective text/background segmentation. See column 3/3-8. In view of this teaching that an input image to be subjected to foreground/background separation can be sub-sampled in order to reduce the computational

intensiveness, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify claim 5 of Curry '882 by Zhu to achieve claim 10 of the present invention by sub-sampling the inputted document image.

In addition, present claim 10 also recites that the selector signal is a "threshold" selector signal and is produced based on the control signal. Such limitations, however, are considered obvious variants of claim 1 of Curry '882 in view of Barthel. As explained above in paragraph 2, Barthel teaches that selector signals produced in an MRC environment are can be conventionally characterized as "threshold" selector signals and based on a control signal.

Dependent claims 11 and 12 of the present invention recite the same additional features as dependent claims 6 and 7, respectively, of Curry '882, and therefore, they are also obvious variants of the corresponding claims of Curry '882.

5. Claims 4-9 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5-7 and 9-11 of U.S. Patent No. 6,987,882 by Curry et al. ("Curry '882") in view of U.S. Patent 6,731,800 by Barthel et al. ("Barthel").

Claims 5-7 and 9-11 of Curry '882 recite all of the limitations of claims 4-9, respectively, of the present application except that present claims 4 and 7 also recite that the selector signal is a "threshold" selector signal and is produced based on the control signal. Such limitations, however, are considered obvious variants of claim 1 of Curry '882 in view of Barthel. As explained above in paragraph 2, Barthel teaches that selector signals produced in an MRC environment are can be conventionally characterized as "threshold" selector signals and based on a control signal.

Claim Objections

6. In view of Applicant's amendments to claims 10-12, the previous claim objections have been withdrawn.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 4-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,731,800 by Barthel et al. ("Barthel").

Regarding claims 4 and 7, Barthel discloses a computer-implemented method (figure 1) for separating an image signal into a set of image planes in accordance with a control signal, the method comprising the operations of:

(a) receiving the control signal and producing a threshold selector signal, via a selector module, based on the control signal (i.e. the "Text Detection (Segmenting)" block receives binary/quantized image data as a "control signal" from the "Quantizing/Binarizing" block; the received signal is then used to produce a "selector" signal that indicates which image regions are selected for subsequent edge processing—see figure 3 where all connected regions in the binary quantized image data are determined, and then size filtration of the regions is performed in order

to identify those regions lying within a certain size range defined by upper and lower size thresholds);

(b) receiving the selector signal and producing a decision signal, via an edge processing module (the "selector" signal is received by a "Nonlinear Edge Detection" step, which performs edge detection on the selected regions; after further processing, a binary mask, or "decision signal," which indicates whether each region corresponds to text or background, is generated); and

(c) receiving the image signal and the decision signal (i.e. the large block in figure 1 receives both), and outputting a foreground signal and a background signal, via a foreground/background separation module, a representation of the current pixel of the image signal being included in at least one of the foreground signal and the background signal in accordance with the decision signal (i.e. a pixel is indicated as being included in either the background image or the foreground image based on the binary mask ("decision signal") outputted from the "Text Detection (Segmenting)" block).

Since Barthel's disclosure is written in terms of a computer-implemented method, it does not expressly disclose the system comprising means or article of manufacture comprising program codes for performing the above steps, *per se*. However, at the time the invention was made, those skilled in the art would have readily understood that Barthel's method was intended to be performed via a computer, thereby necessitating the employment of physical components to perform the method, e.g. processors or the like performing programmed methods/modules. That is to say that the claimed system and article of manufacture having program codes for separating

an image signal are rendered obvious in view of Barthel's corresponding method for the same—*Official Notice taken.*

Regarding claims 5 and 8, Barthel discloses operation (c) further comprises:

receiving the foreground signal (figure 4) and the background signal (figure 5);

filling undefined pixels in the foreground and background signals with values computed so as to substantially prevent artifacts and to facilitate good compression ratio, using a cleanup module (figures 4 and 5: "Filling the remaining regions"; see also column 5, lines 10-15 and 43-47); and

outputting a final foreground signal and a final background signal (see figure 1).

Regarding claim 6 and 9, Barthel discloses the operation of filling comprises:

extending content of defined pixels in each of the foreground and background signals to neighboring undefined pixels by filling neighboring undefined pixels with diluted foreground and background values, respectively, using a dilate module (figures 4 and 5: "spreading");

averaging non-zero content of the diluted foreground and background values over minimum coded unit blocks and outputting averaged block values, using a block average module (column 5, lines 10-15 and 43-47: the average value of all values not equal to zero is calculated and used for filling); and

filling any remaining undefined pixels with the averaged block values, using a fill module (figures 4 and 5: "Filling the remaining regions").

9. Claims 1-3 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,731,800 by Barthel et al. ("Barthel") in view of U.S. Patent 6,301,386 by Zhu et al. ("Zhu").

Regarding claims 1 and 10, Barthel discloses a computer-implemented method (figure 1) for separating an image signal into a set of image planes in accordance with a control signal, the method comprising the operations of:

(a) receiving the control signal and producing a threshold selector signal, via a selector module, based on the control signal (i.e. the "Text Detection (Segmenting)" block receives binary/quantized image data as a "control signal" from the "Quantizing/Binarizing" block; the received signal is then used to produce a "selector" signal that indicates which image regions are selected for subsequent edge processing—see figure 3 where all connected regions in the binary quantized image data are determined, and then size filtration of the regions is performed in order to identify those regions lying within a certain size range defined by upper and lower size thresholds);

(b) receiving the selector signal and producing a decision signal, via an edge processing module (the "selector" signal is received by a "Nonlinear Edge Detection" step, which performs edge detection on the selected regions; after further processing, a binary mask, or "decision signal," which indicates whether each region corresponds to text or background, is generated); and

(c) receiving the image signal and the decision signal (i.e. the large block in figure 1 receives both), and outputting a foreground signal and a background signal, via a foreground/background separation module, a representation of the current pixel of the image

signal being included in at least one of the foreground signal and the background signal in accordance with the decision signal (i.e. a pixel is indicated as being included in either the background image or the foreground image based on the binary mask ("decision signal") outputted from the "Text Detection (Segmenting)" block).

However, Barthel does not appear to disclose "sub-sampling the image by a programmable amount" and then receiving the sub-sampled image for outputting a foreground and a background signal. As shown in figure 1, it appears that Barthel's Determination of the Background/Foreground block receives the inputted document image at the original resolution and does not sub-sample the image prior to receiving it.

Zhu discloses a method (figure 1) for identifying text apart from background in an image in order to process the text for recognition purposes and the like. In particular, Zhu teaches that, prior to segmenting the foreground text from the background (108), it is advantageous to sub-sample the image (103). The sub-sampling step is preferred because, according to Zhu, the reduction in resolution has the effect of reducing processing demands. However, the sub-sampled image will still exhibit sufficient detail to permit effective text/background segmentation. See column 3/3-8. In view of this teaching that an input image to be subjected to foreground/background separation can be sub-sampled in order to reduce the computational intensiveness, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Barthel by Zhu to achieve the claimed invention by sub-sampling the inputted document image.

Further regarding claim 10, since Barthel's disclosure is written in terms of a computer-implemented method, it does not expressly disclose the system comprising means for performing

the above steps, *per se*. However, at the time the invention was made, those skilled in the art would have readily understood that Barthel's method was intended to be performed via a computer, thereby necessitating the employment of physical components to perform the method, e.g. processors or the like performing programmed methods/modules. That is to say that the claimed system for separating an image signal are rendered obvious in view of Barthel's corresponding method for the same—*Official Notice taken.*

Regarding claims 2 and 11, Barthel discloses operation (c) further comprises:

receiving the foreground signal (figure 4) and the background signal (figure 5);

filling undefined pixels in the foreground and background signals with values computed so as to substantially prevent artifacts and to facilitate good compression ratio, using a cleanup module (figures 4 and 5: "Filling the remaining regions"; see also column 5, lines 10-15 and 43-47); and

outputting a final foreground signal and a final background signal (see figure 1).

Regarding claim 3 and 12, Barthel discloses the operation of filling comprises:

extending content of defined pixels in each of the foreground and background signals to neighboring undefined pixels by filling neighboring undefined pixels with diluted foreground and background values, respectively, using a dilate module (figures 4 and 5: "spreading");

averaging non-zero content of the diluted foreground and background values over minimum coded unit blocks and outputting averaged block values, using a block average module (column 5, lines 10-15 and 43-47: the average value of all values not equal to zero is calculated and used for filling); and

filling any remaining undefined pixels with the averaged block values, using a fill module (figures 4 and 5: "Filling the remaining regions").

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000. Any inquiry of a general nature or relating to the status of this application or proceeding can also be directed to the TC 2600 Customer Service Office whose telephone number is (571) 272-2600.

Colin M. LaRose
Group Art Unit 2624
2 July 2007